Complete Summary

GUIDELINE TITLE

Migraine headache.

BIBLIOGRAPHIC SOURCE(S)

Institute for Clinical Systems Improvement (ICSI). Migraine headache. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2003 Jul. 68 p. [124 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Migraine headache

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Prevention
Treatment

CLINICAL SPECIALTY

Family Practice
Internal Medicine
Neurology
Obstetrics and Gynecology

Pediatrics
Pharmacology

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Health Plans
Hospitals
Managed Care Organizations
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To increase the rate of appropriate diagnosis of migraines
- To increase the functional status of those with migraine
- To increase the rate of treatment plans or adherence to plan for mild, moderate, and severe headaches for migraine sufferers
- To reduce the use of narcotics and barbiturates for the treatment of migraines
- To increase education for migraine sufferers
- To reduce the number of imaging studies for migraine
- To increase the consideration and diagnosis of hormonal mediated migraines

TARGET POPULATION

Patients age 12 years and older with suspected or confirmed migraine headaches

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Evaluation

1. Detailed history of headaches (e.g., characteristics; severity; precipitating, aggravating factors, and relieving factors)
2. Focused physical examination
3. Neurological examination
4. Evaluation of causes for concern
5. Selective diagnostic testing including neuroimaging (computed tomography [CT] or magnetic resonance imaging [MRI]), electroencephalogram, lumbar puncture, cerebrospinal fluid, and blood studies, as appropriate to evaluate for secondary headache if causes of concern have been identified in the patient history or physical examination
6. Specialty consultation as indicated

Management/Treatment

1. Patient education and lifestyle management
2. Pharmacologic management/treatment: acetaminophen; acetylsalicylic acid (ASA); lidocaine 4% solution; isometheptene mucate

dichloralphenazone/acetaminophen (Midrin®); nonsteroidal anti-inflammatory drugs (NSAIDS) (ibuprofen [Advil®, Motrin®, Nuprin®], ketoprofen [Orudis K®, Actron®], naproxen sodium [Anaprox ®, Aleve®]); 5 HT agonists (Triptans): (naratriptan [Amerge®], almotriptan [Axert®], frovatriptan [Frova ®], rizatriptan [Maxalt®, Maxalt MLT®] sumatriptan [Imitrex®], eletriptan [Relpax®]; zolmitriptan [Zomig®, Zomig-ZMT]); dihydroergotamine mesylate (DHE, D.H.E. 45®, Migranal®); ergotamine (Cafergot®, Ergomar®); chlorpromazine injection (Thorazine®); droperidol (Inapsine); ketorolac IM (Toradol®); prochlorperazine (Compazine®); dexamethasone (Decadron®); hydrocortisone (Solu-Cortef®); meperidine (Demerol®)

3. Adjunctive therapy: caffeine; hydroxyzine (Vistaril®); metoclopramide (Reglan®); prochlorperazine (Compazine®); promethazine (Phenergan®)
4. Prophylactic pharmacologic treatment: anticonvulsants, such as valproic acid (sodium valproate) (Depakote®); beta-blockers [atenolol (Tenormin®), metoprolol (Lopressor®), nadolol (Corgard®) propranolol (Inderal®); timolol (Blocadren); tricyclics [amitriptyline (Elavil®), doxepin (Sinequan®), nortriptyline (Aventyl®) (Pamelor®); hormones (estradiol patches, estrogen-containing contraceptives, gonadotropin-releasing hormone [GnRH] agonists)
5. Other strategies, such as biofeedback, feverfew (an herbal therapy), magnesium, relaxation training, riboflavin
6. Specialty referral as indicated

Notes

- The guideline developers considered, but did not find sufficient evidence to recommend the following management strategies: acupuncture, cervical manipulation, massage, homeopathy and naturopathy, Cognitive Behavioral Therapy, Transcutaneous Electrical Stimulation (TENS) units
- The guideline developers considered, but did not recommend, the following drugs for the management of migraines: codeine, barbiturates (phenobarbital, butalbital)

*Note from the National Guideline Clearinghouse (NGC): On December 23, 2004, the FDA issued a public health advisory concerning the use of non-steroidal anti-inflammatory drug products (NSAIDs) including the COX-2 selective agents Celebrex (celecoxib), Bextra (valdecoxib), and a non-selective NSAID, naproxen (sold as Aleve, Naprosyn, and other trade name and generic products). See the FDA Web site for more information.

MAJOR OUTCOMES CONSIDERED

- Accuracy of diagnostic assessments and diagnostic yield
- Functional status and quality of life
- Degree of migraine headache relief
- Migraine headache frequency and severity
- Migraine symptoms (nausea, vomiting, vision disturbances)
- Need for analgesic medication
- Risk of stroke with oral contraceptive use
- Safety, cost, and side effects of medications

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Key conclusions (as determined by the work group) are supported by a conclusion grading worksheet that summarizes the important studies pertaining to the conclusion. Individual studies are classed according to the system presented below, and are designated as positive, negative, or neutral to reflect the study quality.

Conclusion Grades:

Grade I: The evidence consists of results from studies of strong design for answering the question addressed. The results are both clinically important and consistent with minor exceptions at most. The results are free of any significant doubts about generalizability, bias, and flaws in research design. Studies with negative results have sufficiently large samples to have adequate statistical power.

Grade II: The evidence consists of results from studies of strong design for answering the question addressed, but there is some uncertainty attached to the conclusion because of inconsistencies among the results from the studies or because of minor doubts about generalizability, bias, research design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from weaker designs for the question addressed, but the results have been confirmed in separate studies and are consistent with minor exceptions at most.

Grade III: The evidence consists of results from studies of strong design for answering the question addressed, but there is substantial uncertainty attached to the conclusion because of inconsistencies among the results of different studies or because of serious doubts about generalizability, bias, design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from a limited number of studies of weak design for answering the question addressed.

Grade Not Assignable: There is no evidence available that directly supports or refutes the conclusion.

Study Quality Designations:

The quality of the primary research reports and systematic reviews are designated in the following ways on the conclusion grading worksheets:

Positive: indicates that the report or review has clearly addressed issues of inclusion/exclusion, bias, generalizability, and data collection and analysis.

Negative: indicates that these issues (inclusion/exclusion, bias, generalizability, and data collection and analysis) have not been adequately addressed.

Neutral: indicates that the report or review is neither exceptionally strong nor exceptionally weak.

Not Applicable: indicates that the report is not a primary reference or a systematic review and therefore the quality has not been assessed.

Classes of Research Reports:

A. Primary Reports of New Data Collection:

   Class A:

   - Randomized, controlled trial

   Class B:

   - Cohort study

   Class C:

   - Non-randomized trial with concurrent or historical controls
   - Case-control study
   - Study of sensitivity and specificity of a diagnostic test
   - Population-based descriptive study

   Class D:

   - Cross-sectional study
   - Case series
   - Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports:

   Class M:

   - Meta-analysis
   - Systematic review

- Decision analysis
- Cost-effectiveness analysis

Class R:

- Consensus statement
- Consensus report
- Narrative review

Class X:

- Medical opinion

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

The guideline developers reviewed published cost analyses.

Burden of Suffering

Migraines have an economic impact through significant losses in productivity as well as through health care costs. The cost in dollars is probably somewhere between $1.4 billion and $17.2 billion. For an estimated 6,196,378 migraine sufferers who work outside the home, lost productivity is approximately $1.4 billion a year, with 1.4 to 4.0 work days lost annually. Employers lose $5.6 to $17.6 billion annually in production. For an estimated 648 migraineurs surveyed, the total annual medical expenditure was $529,199. This figure includes emergency room visits, general medical attention, specialists, hospitalizations, and prescription and over-the-counter medications.

Diagnostic Testing

In a retrospective study, 592 patients with headaches and normal neurological exam were examined by computed tomography (CT) scanning between 1990 and

1993 at a cost of $1,000 per scan. None of the patients had any serious intracranial pathology identified. This technique is costly and unrewarding.

METHOD OF GUIDELINE VALIDATION

Clinical Validation-Pilot Testing
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Institute Partners: System-Wide Review

The guideline draft, discussion, and measurement specification documents undergo thorough review. Written comments are solicited from clinical, measurement, and management experts from within the member medical groups during an eight-week period of "Critical Review."

Each of the Institute's participating medical groups determines its own process for distributing the guideline and obtaining feedback. Clinicians are asked to suggest modifications based on their understanding of the clinical literature coupled with their clinical expertise. Representatives from all departments involved in implementation and measurement review the guideline to determine its operational impact. Measurement specifications for selected measures are developed by the Institute for Clinical Systems Improvement (ICSI) in collaboration with participating medical groups following general implementation of the guideline. The specifications suggest approaches to operationalizing the measure.

Guideline Work Group: Second Draft

Following the completion of the "Critical Review" period, the guideline work group meets 1 to 2 times to review the input received. The original guideline is revised as necessary, and a written response is prepared to address each of the suggestions received from medical groups. Two members of the Committee on Evidence-Based Practice carefully review the Critical Review input, the work group responses, and the revised draft of the guideline. They report to the entire committee their assessment of two questions: (1) Have the concerns of the medical groups been adequately addressed? (2) Are the medical groups willing and able to implement the guideline? The committee then either approves the guideline for pilot testing as submitted or negotiates changes with the work group representative present at the meeting.

Pilot Test

Medical groups introduce the guideline at pilot sites, providing training to the clinical staff and incorporating it into the organization's scheduling, computer, and other practice systems. Evaluation and assessment occur throughout the pilot test phase, which usually lasts for three months. Comments and suggestions are solicited in the same manner as used during the "Critical Review" phase.

The guideline work group meets to review the pilot sites' experiences and makes the necessary revisions to the guideline, and the Committee on Evidence-Based Practice reviews the revised guideline and approves it for implementation.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The recommendations for the management of migraine headaches are presented in the form of 8 algorithms with 109 components, accompanied by detailed annotations. In addition to a Main algorithm, algorithms are provided for: Diagnosis; Acute Treatment; DHE (Dihydroergotamine Mesylate); Menstrual Migraine; Perimenopausal or Menopausal Migraine; On Estrogen Containing Contraceptives or Considering Estrogen Containing Contraceptives with Migraine; and Prophylactic Treatment. Clinical highlights and selected annotations (numbered to correspond with the algorithm) follow.

Class of evidence (A-D, M, R, X) and conclusion grade (I-III, Not Assignable) definitions are repeated at the end of the "Major Recommendations" field.

Clinical Highlights

1. Migraine is diagnosed by history and physical examination with limited need for imaging or laboratory tests. (Annotation #8)
2. Warning signs of possible disorder other than migraine headache are:
    - Subacute and/or progressive headaches which worsen over time (months)
    - A new or different headache
    - Any headache of maximum severity at onset
    - Headache of new onset after age 40
    - Persistent headache precipitated by a Valsalva maneuver
    - Evidence such as fever, hypertension (HTN), myalgias, weight loss, or scalp tenderness suggesting a systemic disorder
    - Presence of subtle neurological signs may suggest a secondary cause
    - Seizures

    (Annotation #9)

3. Appropriate pharmacological or analgesic treatment of acute migraine should generally not exceed >2 days per week on a regular basis. More than this may result in chronic daily headaches. (Annotations #13, 24)
4. Most medications should be started in a low dose, titrated to a therapeutic dose to minimize side effects, and maintained at target dose for 8-12 weeks to obtain maximum efficacy. (Annotation #103)
5. Migraines occurring in association with menses and not responsive to standard cyclic prophylaxis may respond to hormonal prophylaxis with use of estradiol patches or estrogen-containing contraceptives. (Annotation #92 - see the original guideline document)
6. Women who have migraines with aura should avoid use of estrogen-containing contraceptives. Headaches occurring during perimenopause or

after menopause may respond to hormonal therapy. (Annotation #92 - see the original guideline document)
7. Disability from headaches is an important issue for migraineurs. (Annotation #24)

Main Algorithm Annotations

1. Patient Presents with Complaint of a Headache

   A patient may present for care of headaches during an attack or during a headache-free period. If a patient presents during a headache, appropriate evaluation (history, examination, appropriate testing) needs to be undertaken acutely. Once the diagnosis of migraine is established, acute treatment is instituted. If the patient has a history of recurrent headaches, a plan for treatment (acute and/or prophylactic) needs to be established.

2. Diagnosis Algorithm

   Refer to Annotation Appendix B, "Modified Diagnostic Criteria," in the original guideline document to establish diagnosis.

Diagnosis Algorithm Annotations

8. Critical First Steps

   Detailed History

   Functional disabilities at work, school, housework, or leisure activities during the past 3 months (informally or using well-validated disability questionnaire).

   Assessment of the headache characteristics requires determination of the following:

   Temporal profile:

   - Time from onset to peak
   - Usual time of onset (season, month, menstrual cycle, week, hour of day)
   - Frequency/duration
   - Stable or changing over past 6 months and lifetime

   Descriptive Characteristics (pulsatile, throbbing, pressing, sharp, etc.)
   Location (uni- or bilateral, changing sides)
   Severity
   Precipitating features/factors which aggravate and/or relieve the headache
   Factors which relieve the headache
   Pharmacological and non-pharmacological treatments which are effective or ineffective
   Aura (present in approximately 15% of migraine patients)

Evidence supporting this recommendation is of class: R

Focused Physical Exam

Vital signs (blood pressure, pulse, respirations, and temperature)
Cardiovascular status evaluation
Extracranial structure evaluation such as sinuses, scalp arteries, cervical paraspinal muscles
Examination of the neck in flexion versus lateral rotation for meningeal irritation. (Even a subtle limitation of neck flexion may be considered an abnormality.)

Focused Neurological Examination

A focused neurological examination may be capable of detecting most of the abnormal signs likely to occur in patients with headache due to acquired disease or a secondary headache.

This exam should include at least the following evaluations:

- Assessment of patient's awareness and consciousness, of presence of confusion, and memory impairment
- Ophthalmological exam to include pupillary symmetry and reactivity, optic fundi, presence or absence of papilledema, visual field defects, and ocular motility abnormalities not part of the patient's prior known history
- Cranial nerve examination to include corneal reflexes, facial sensation, and facial symmetry
- Symmetric muscle tone, strength (may be as subtle as arm or leg drift), or muscle stretch reflex
- Sensory symmetry
- Plantar response(s)
- Gait, arm and leg coordination

Evidence supporting this recommendation is of class: R

9. Causes for Concern?

Causes for concern must be evaluated irrespective of the patient's past history of headache. Warning signs of possible disorder other than migraine headache are:

- Subacute and/or progressive headaches which worsen over time (months)
- A new or different headache or a statement by a headache patient that "this is the worst headache ever"
- Any headache of maximum severity at onset
- Headaches of new onset after the age of 40 years old
- Persistent headache precipitated by a Valsalva maneuver such as cough, sneeze, bending, or with exertion (physical or sexual)

- Evidence such as fever, hypertension, myalgias, weight loss, or scalp tenderness suggesting a systemic disorder
- Presence of subtle neurological signs may suggest a secondary cause (e.g., meningismus, confusion, altered levels of consciousness, changes or impairment of memory, papilledema, visual field defect, cranial nerve asymmetry, extremity drifts or weaknesses, clear sensory deficits, reflex asymmetry, extensor plantar response, or gait disturbances).
- Seizures

Evidence supporting this recommendation is of class: R

11. Meets Criteria for Migraine?

The table in Annotation Appendix B "Modified Diagnostic Criteria" of the original guideline document has been modified from the International Headache Society (IHS) criteria, and describes the differentiating criteria applicable for the diagnosis of migraine and other primary headache disorders. Chronic daily headaches should not be managed via this guideline.

Evidence supporting this recommendation is of class: B

13. Initiate Patient Education and Lifestyle Management

Education

While education is of paramount importance in managing any chronic illness, it is especially important in the ongoing management of migraine. Patients may have to make lifestyle changes and are often required to make self-management choices in the treatment of individual headaches and to maintain a diary to clarify the frequency, severity, triggers, and treatment responses of their headaches. Refer to the original guideline document for detailed information regarding lifestyle changes and self-management.

Evidence supporting this recommendation is of classes: A, R

15. Specialty Consultation Indicated?

The decision to make a specialty referral will depend upon the practitioner's familiarity and comfort with migraine and its management. Specialty consultation may be considered when:

- The diagnosis cannot be confirmed.
- Etiology cannot be diagnosed or warning signals are present.
- Migraine attacks are occurring with a frequency or duration sufficient to impair the patient's quality of life despite treatment; the patient has failed to respond to acute remedies or is in status migrainosus

16. Perform Diagnostic Testing

There are, as yet, no tests which confirm the diagnosis of migraine. Selective testing, including neuroimaging (computed tomography [CT] or magnetic

resonance imaging [MRI]), electroencephalogram, lumbar puncture, cerebrospinal fluid, and blood studies, may be indicated to evaluate for secondary headache if causes of concern have been identified in the patient history or physical examination (see Annotation #9, "Causes for Concern?"). Diagnosis may be complicated if several headache types coexist in the same patient.

Evidence supporting this recommendation is of classes: C, M, R

Acute Treatment Algorithm Annotations

21. Patient Meets Criteria for Acute Treatment

It is expected that a patient undergo a diagnostic work-up (see the Diagnosis Algorithm) establishing the primary headache disorder of migraine (see Annotation Appendix B in the original guideline document, "Modified Diagnostic Criteria") before initiating acute treatment.

22. Is Patient Experiencing a Typical Headache?

Each individual headache must be evaluated in the context of the patient's prior migraine attacks. The practitioner must always remain alert to the possibility of secondary causes for headache, particularly when there is a previously established history of a primary headache disorder such as migraine.

Migraine does not preclude the presence of underlying pathology (arterial dissection, intracranial aneurysm, venous sinus thrombosis, ischemic or hemorrhagic stroke, temporal arteritis, etc.) which may also present with "vascular headaches." If the history is scrutinized, ominous causes for headaches can often be identified and treated and the potential for catastrophe avoided.

24. Categorize According to Peak Severity Based on Functional Impairment, Duration of Symptoms, and Time to Peak Impairment

Severity levels:

Mild - Patient is aware of a headache but is able to continue daily routine with minimal alteration.

Moderate - The headache is significant enough to interfere substantially with daily activities but is not completely incapacitating.

Severe - The headache is incapacitating.

Status - A severe headache that has lasted more than 72 hours.

This categorization influences choice of treatment method. For example, parenteral administration (subcutaneous, nasal) should strongly be

considered for people whose time to peak disability is <1 hour, who awaken with headache, and for those with severe nausea and vomiting.

Determining functional limitations during migraine episodes may be the key to determining the best treatment for a patient. Physicians and patients should stratify treatment based on severity rather than using stepped care, recognizing patients will often use stepped care within an attack. This algorithm uses a stratified-care model.

Evidence supporting this recommendation is of classes: A, C

26. Pharmacological Treatment

The guideline work group presumes most mild migraine headaches will be managed by self-care, so emphasizes over-the-counter (OTC) medications. However, since only 2 to 12% of initially mild migraine episodes remain mild (with the remainder progressing), treatments effective for mild headaches may be useful for only a short time. Studies on treatment of migraine headache at the mild level show that triptans are more effective in abolishing pain at this stage than if the headache is more severe. It is acceptable to use other symptomatic headache relief drugs as well as triptans for mild headache. However, current retrospective analyses of mild pain treatment studies reveal triptan response to 2 hour pain freedom to be superior to any other comparator drug.

Evidence supporting this recommendation is of classes: A, C, D, M, R

27. Successful?

Common reasons for acute migraine treatment failure are provided in the original guideline document.

30. Moderate Treatment

The guideline emphasizes the use of vasoactive drugs over narcotics and barbiturates, recognizing that many migraineurs are currently treated with drugs from the latter two classes. The guideline developers have specifically excluded butorphanol because of its high potential for abuse and adverse side effect profile.

35. Status (>72 Hour Duration)

It is recommended that the patient be hydrated prior to neuroleptic administration with 250 to 500 cc of 5% dextrose with 0.45% NaCl, and advised of the potential for orthostatic hypotension and acute extrapyramidal side effects. The patient should be observed in a medical setting as clinically appropriate after administration of a neuroleptic and should not drive for 24 hours.

36. Adjunctive Therapy

See Adjunctive Therapy table, Annotation Appendix A in the original guideline document. As adjunctive therapy, any of the listed medications can be used singularly or in compatible combination. For intermittent, infrequent headache, caffeine should be added as first choice when not contraindicated. The use of caffeine in patients with chronic daily headache is to be discouraged. The prokinetic agent metoclopramide could be considered next. This guideline has no other preferences.

37. Patient Meets Criteria for Dihydroergotamine (DHE)?

DHE must not be given to patients with the following conditions:

- Pregnancy
- History of ischemic heart disease
- History of variant angina
- Severe peripheral vascular disease
- Onset of chest pain following administration of test dose
- Within 24 hours of receiving sumatriptan

Intravenous DHE is the method most frequently employed to terminate a truly intractable migraine attack or migraine status. The protocol outlined in the DHE algorithm is effective in eliminating an intractable migraine headache in up to 90% of patients within 48 hours. This method of administration has also been found to be effective in terminating an acute cycle of cluster headaches as well as chronic daily headaches with or without analgesic/ergotamine rebound.

39. Chlorpromazine, Depacon, Droperidol, Magnesium Sulfate IV or Prochlorperazine

See the Status Therapy table, Annotation Appendix A in the original guideline document, "Drug Treatment Tables." Patients with a history of dystonic reaction should be premedicated with diphenhydramine or benztropine (Cogentin).

If chlorpromazine, valproate sodium (Depacon), droperidol, or magnesium sulfate IV were used previously, one may not wish to repeat.

Evidence supporting this recommendation is of class: A, C, D

40. Ketorolac or Meperidine

See the Status Therapy table, Annotation Appendix A, "Drug Treatment Tables" in the original guideline document.

Evidence supporting this recommendation is of class: C

41. Dexamethasone

See the Status Therapy table, Annotation Appendix A, "Drug Treatment Tables" in the original guideline document.

Evidence supporting this recommendation is of class: C

DHE (Dihydroergotamine Mesylate) Algorithm Annotations

47. Metoclopramide 10 mg Intravenous (IV)

Metoclopramide (10 mg) is given either by direct IV injection over 2 to 3 minutes, or in 50 mL of normal saline and infused intravenously over 15 minutes. Each dose of metoclopramide should be administered 15 minutes prior to each DHE injection. Although uncommon, acute extrapyramidal side effects such as dystonia, akathisia, and oculogyric crisis may occur after administration of metoclopramide. Benztropine mesylate (Cogentin) is effective in terminating this unusual adverse event given as a 1-mg injection (IV or intramuscularly [IM]). Often after 5 doses, metoclopramide may be given as needed for (prn) nausea.

Evidence supporting this recommendation is of class: A

49. Begin Continuous DHE

Begin DHE 3 mg in 1,000 mL normal saline at 42 mL/hr.

Continue metoclopramide 10 mg IV every 8 hours (q8h), prn, nausea.

Side effects:

- If significant nausea occurs at any time, reduce the rate of DHE to 21 to 30 mL/hr.
- If diarrhea occurs, give diphenoxylate with atropine (Lomotil), 1 or 2 tablets, three times a day (tid), prn.
- If excessive anxiety, jitteriness (akathisia), or dystonic reaction occurs, give IV benztropine (Cogentin) 1 mg.

It may be continued up to 7 days. Opioid analgesics should not be used with either protocol since these are likely to prolong the headache via analgesic rebound.

50. DHE 0.5 mg IV Over 2-3 Minutes (Test Dose)

A test dose of DHE (0.5 mg) is given either as a direct IV push slowly over 2 to 3 minutes or as an infusion diluted in 50 mL of normal saline over 15 to 30 minutes.

52. Blood Pressure (BP) Stable / No Chest Pain?

DHE is relatively contraindicated if blood pressure is sustained $\geq$165/95. Discontinue DHE if patient develops chest pain.

54. Common Side Effects

The most common side effects include nausea, vomiting, diarrhea, abdominal cramps, and leg pain. These side effects usually resolve by reducing the dose and coadministering metoclopramide as an antiemetic. Diarrhea can be managed with diphenoxylate with atropine (Lomotil), one or two tablets three times daily or as needed. Although most patients who respond will do so within 48 hours, this protocol may be continued for 3 to 5 days in those patients whose response is suboptimal.

Menstrual Migraine Algorithm Annotations

65. Menstrual Migraine

"Menstrual migraine," a term misused by both patients and doctors, lacks precise definition. The literature has proposed that menstrual-only migraine be defined as attacks exclusively starting on day 1 ± 2 days of the menstrual cycle; the woman should be free from attacks at all other times of the cycle. Many women who don't have attacks exclusively with menses have menstrual-associated migraines.

66. Diagnosis of Menstrual Migraine Confirmed with Calendar Record?

The provider and patient need to discuss diary documentation. The patient should keep a continuous daily record for at least 2 months to include the following:

- Day/time of headache
- Severity of headache
- Duration
- Onset of menstrual flow

74. Cyclic Prophylaxis
    - Nonsteroidal anti-inflammatory drugs (NSAIDs)

      Nonsteroidal anti-inflammatory drugs should be considered approaches of first choice in the prophylactic treatment of migraine associated with menses. Naproxen sodium 550 mg twice a day (bid) has been used as a preventive agent, although other NSAIDS may also be effective. Typically, the agent is initiated two to three days before anticipated onset of the headache and continued through the at-risk period. [Conclusion Grade III: See Discussion Appendix A in the original guideline document, Conclusion Grading Worksheet- Annotation #73 (NSAIDs)]

      *Note from the National Guideline Clearinghouse (NGC): On December 23, 2004, the FDA issued a public health advisory concerning the use of non-steroidal anti-inflammatory drug products (NSAIDs) including the COX-2 selective agents Celebrex (celecoxib), Bextra (valdecoxib), and a non-selective NSAID, naproxen (sold as Aleve, Naprosyn, and other trade name and generic products). See the FDA Web site for more information.

- Triptans
- Ergots

Evidence supporting this recommendation is of classes: A, C, D, R

75. Hormonal Prophylaxis
    - Estradiol Patches

      Estrogen levels decrease during the late luteal phase of the menstrual cycle, likely triggering migraine. Estrogen replacement prior to menstruation has been used to prevent migraine.

      Estradiol patches, 50 to 100 micrograms, are applied 48 hours prior to expected onset of migraine and used for one week.

    - Estrogen-Containing Contraceptives

      Oral contraceptives have a variable effect on migraines, causing worsening of headaches in some patients, improvement of headaches in a small percentage of patients, and no change in migraines in other patients. We are not aware of any population-based studies on this topic.

    - Gonadotropin-Releasing Hormone (GnRH) Agonists with "add back" therapy

      For patients with severe menstrual migraine unrelieved by other therapies, suppression of the menstrual cycle with a gonadotropin-releasing hormone agonist and "add back" therapy may be effective. Lupron Depot 3.75 mg IM is given monthly with "add back" therapy such as 0.1 mg transdermal estradiol patches and oral medroxyprogesterone acetate 2.5 mg daily.

76. Evidence supporting this recommendation is of classes: C, D, R

Perimenopausal or Menopausal Migraine Algorithm Annotations

77. Perimenopausal or Menopausal with Active Migraine History

    Menopause is the cessation of menses.

    Perimenopause is the span of time from the reproductive to the post-reproductive interval, as defined in the National Guideline Clearinghouse summary of the Institute for Clinical Improvement's (ICSI's) Menopause and Hormone Replacement Therapy (HRT) guideline.

    Hormonal therapy may worsen, improve, or leave migraines unchanged.

    Evidence supporting this recommendation is of class: R

82. Hormonal Therapy
    - Transdermal or oral estrogen
    - Progestin if indicated
    - Estrogen-containing contraceptives

    Refer to the NGC summary of the ICSI guideline Menopause and Hormone Replacement Therapy (HRT).

    Evidence supporting this recommendation is of class: R

83. Therapy Successful?

    Successful is commonly defined as a 50% reduction in frequency in headache days and/or severity of headaches.

On Estrogen-Containing Contraceptives or Considering Estrogen-Containing Contraceptives with Migraine Algorithm Annotations

91. On Estrogen-Containing Contraceptives or Considering Estrogen-Containing Contraceptives with Migraine

    Migraine patients who do not have absolute contraindications to estrogen-containing contraceptives should consider that estrogen-containing contraceptives may have unpredictable effects on the severity and/or frequency of headaches. In addition, evidence exists that the risk of ischemic stroke increases for migraineurs taking estrogen-containing contraceptives.

    Evidence supporting this recommendation is of classes: C, R

93. Evaluate Stroke Risk Factors
    - Risk factors for coronary artery disease (CAD)
    - Migraine aura

      Women who have migraine with a relatively brief common aura type (e.g., visual aura under 30 minutes) probably have significantly increased ischemic stroke risk if estrogen-containing contraceptives are used. This risk probably increases with age as baseline stroke rates increase, so that the increased risk may be acceptable to the younger patient (e.g. under age 30), but not to the older patient. It is probably too simplistic to say that no patient with migraine with aura should use estrogen-containing contraceptives. The decision should be individualized and should be made with the patient.

      It appears reasonable that women who have prolonged migraine auras (certainly those beyond 60 minutes), multiple aura symptoms, or less common aura symptoms (e.g., dysphasia, hemiparesis) should be strongly discouraged from using estrogen-containing contraceptives.

      Patients who develop a migraine aura for the first time while taking estrogen-containing contraceptives, or whose previous typical migraine

aura becomes more prolonged or complex, should discontinue estrogen-containing contraceptives.

Use of oral contraceptives in patients with a history of migraine increases the risk of stroke [Conclusion Grade II: See Discussion Appendix B of the original guideline document, Conclusion Grading Worksheet - Annotation #93 (Risk of Stroke)]

- Women with migraine aura who smoke and are hypertensive further increase their risk. Additional risk is also noted if they are taking estrogen-containing contraceptives.

Evidence supporting this recommendation is of classes: C, R

Prophylactic Treatment Algorithm Annotations

103. Patient Meets Criteria for Prophylactic Treatment

Criteria for Prophylactic Treatment

- Three or more severe migraine attacks per month that fail to respond adequately to symptomatic therapy.
- Less frequent but protracted attacks which impair the patient's quality of life.

Prophylactic Therapy

Prior to instituting prophylactic therapy for migraine, it is imperative that realistic goals and expectations be established. Patients should have a clear understanding that the goals of preventative therapy are to:

- Decrease migraine attack frequency by more than 50%
- Decrease pain and disability with each individual attack
- Enhance response to acute, specific, anti-migraine therapy

One or more of these goals may be achieved.

104. First Line Treatment

Medications

The choice of prophylactic agent depends upon:

- Potential efficacy
- Side effect profile
- Comorbid conditions
- Medication interactions

Patients should also understand that there is usually a latency of at least 3 to 6 weeks between the initiation of medication and recognizable efficacy. Often,

an 8 to 12 week trial is necessary, allowing an adequate period for drug titration to a dosage likely to attain efficacy. It is also not uncommon for initial side effects to subside after continued therapy, and patients should be made aware of this so as to avoid premature discontinuation of a potentially effective medication.

First Line Treatment

The choice of prophylactic medication should be individualized according to the side effect profile, the presence of comorbid conditions, and risk of medication interaction. For example, a tricyclic antidepressant may be especially useful with a migraineur with depression, while sodium valproate may be ideal for a patient with epilepsy.

There are additional medications other than the drugs recommended in the table in Annotation Appendix A of the original guideline document, "Drug Treatment Tables," which may be of equal effectiveness. They are not included in the table, however, because of infrequent use by primary care physicians.

Evidence supporting this recommendation is of classes: A, C

Reinforce Education and Lifestyle Management

See Annotation #13 in the Diagnosis Algorithm.

Factors that May Trigger Migraine

Certain influences can lead to a migraine attack. It is important to note that although a single trigger may provoke the onset of a migraine, a combination of factors is much more likely to set off an attack.

Refer to the original guideline document for a detailed list of triggers, including environmental triggers, lifestyle habits, hormonal triggers, emotional triggers, medications, and dietary triggers.

Biofeedback

Various methods of biofeedback have been used as adjunctive therapy for migraine. This treatment modality should be considered, particularly for pregnant patients and those not easily treated with pharmacological agents. Thermal control is frequently the preferred technique, wherein the patient learns to elevate finger temperature during therapy sessions using a digital temperature reading device.

Biofeedback is time-consuming and requires a commitment on the part of the patient.

Evidence supporting this recommendation is of class: C

Butterbur root (Petasites hybridus)

An extract from the plant Petasites hybridus has been shown to have benefit for migraine prevention. Dosages were from 100 to 150 mg per day in these studies.

Evidence supporting this recommendation is of class: A

Cognitive Behavioral Therapy

This therapy is based on the premise that anxiety and distress aggravate an evolving migraine, and has the potential for helping the patient recognize maladaptive responses that may trigger a headache.

Evidence supporting this recommendation is of class: R

Feverfew

This herbal therapy is made from crushed chrysanthemum leaves. 250 micrograms of the active ingredient, parthenolide, is considered necessary for therapeutic effectiveness. Because these are herbal preparations, the quantity of active ingredient varies with the producer.

Evidence supporting this recommendation is of classes: A, M

Magnesium

Daily oral dosages of 400 to 600 mg of this salt have been shown to be of benefit to migraineurs in European studies.

Evidence supporting this recommendation is of class: A

Relaxation Training

Relaxation training includes progressive muscular relaxation, breathing exercises, and directed imagery. The goal is to develop long-term skills rather than to treat individual events. Repetitive sessions and practice by the patient increase the successfulness of these therapies in reducing headache frequency.

Evidence supporting this recommendation is of class: A

Riboflavin

A randomized, placebo-controlled study has found daily supplements of 400 mg moderately effective in reducing the frequency and severity of migraine.

Evidence supporting this recommendation is of class: A

Several additional treatment modalities are available. The modalities listed below lack sufficient scientific support to be recommended as therapies of proven value.

Acupuncture

This therapy has been found to be expensive and of variable availability. Controlled studies specifically applied to migraine have produced mixed findings.

Evidence supporting this recommendation is of class: A

Cervical Manipulation

Previous studies suggested potentially high levels of risk associated with improper application of this modality. Although more recent studies report few complications, the scientific evidence is not convincing to show significant benefits. There is well documented evidence of cerebral infarction and death from cervical manipulation.

Evidence supporting this recommendation is of classes: A, D

Massage, Homeopathy and Naturopathy

TENS (Transcutaneous Electrical Stimulation) Units

TENS units for migraine or muscle contraction headache have not been found to be more beneficial than placebo when evaluated in a controlled study.

Evidence supporting this recommendation is of class: A

106. Continue Treatment for 6-12 Months, Then Reassess

After 6 to 12 months, a gradual taper is recommended unless headaches become more frequent or more severe.

107. Try Different First Line Medication or Different Drug of Same Class

Monotherapy is generally recommended with dose increasing until patient receives benefit, maximum recommended dose is reached, or unacceptable side effects occur. Failure with one medication does not preclude using another from the same class.

108. Try Combination of Beta-Blockers and Tricyclics

A beta-blocker and a tricyclic antidepressant may be more effective and produce fewer side effects in combination than a single drug at a higher dose from either class.

Definitions

Conclusion Grades:

Grade I: The evidence consists of results from studies of strong design for answering the question addressed. The results are both clinically important and consistent with minor exceptions at most. The results are free of any significant doubts about generalizability, bias, and flaws in research design. Studies with negative results have sufficiently large samples to have adequate statistical power.

Grade II: The evidence consists of results from studies of strong design for answering the question addressed, but there is some uncertainty attached to the conclusion because of inconsistencies among the results from the studies or because of minor doubts about generalizability, bias, research design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from weaker designs for the question addressed, but the results have been confirmed in separate studies and are consistent with minor exceptions at most.

Grade III: The evidence consists of results from studies of strong design for answering the question addressed, but there is substantial uncertainty attached to the conclusion because of inconsistencies among the results of different studies or because of serious doubts about generalizability, bias, design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from a limited number of studies of weak design for answering the question addressed.

Grade Not Assignable: There is no evidence available that directly supports or refutes the conclusion.

Classes of Research Reports:

A. Primary Reports of New Data Collection:

   Class A:

   - Randomized, controlled trial

   Class B:

   - Cohort study

   Class C:

   - Non-randomized trial with concurrent or historical controls
   - Case-control study
   - Study of sensitivity and specificity of a diagnostic test
   - Population-based descriptive study

   Class D:

   - Cross-sectional study
   - Case series
   - Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports:

Class M:

- Meta-analysis
- Systematic review
- Decision analysis
- Cost-effectiveness analysis

Class R:

- Consensus statement
- Consensus report
- Narrative review

Class X:

- Medical opinion

CLINICAL ALGORITHM(S)

Detailed and annotated clinical algorithms are provided for migraine headaches, including a Main algorithm as well as the following algorithms:

- Diagnosis
- Acute Treatment
- DHE (Dihydroergotamine Mesylate)
- Menstrual Migraine
- Perimenopausal or Menopausal Migraine
- On Estrogen-Containing Contraceptives or Considering Estrogen-Containing Contraceptives with Migraine
- Prophylactic Treatment

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The guideline contains an annotated bibliography and discussion of the evidence supporting each recommendation. The type of supporting evidence is classified for selected recommendations (see "Major Recommendations").

In addition, key conclusions contained in the Work Group's algorithm are supported by a grading worksheet that summarizes the important studies pertaining to the conclusion. The type and quality of the evidence supporting these key recommendations (i.e., choice among alternative therapeutic approaches) is graded for each study.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate diagnosis, evaluation, and management of migraine headaches, leading to the prevention of or reduction in symptoms and improvement in functional status

POTENTIAL HARMS

Side Effects of Medication

Refer to Appendix A of the original guideline document, "Drug Treatment Tables" for a list of side effects of recommended drugs.

Subgroups Most Likely to be Harmed

Refer to Appendix C in the original guideline document, "Food and Drug Administration (FDA) Risk Factors for Drug Treatment in Pregnant Women" for precautions in pregnant and lactating women.

CONTRAINDICATIONS

CONTRAINDICATIONS

- Non-steroid anti-inflammatory drugs: Contraindications include active peptic ulcer disease, renal insufficiency.
- Triptans: Contraindications include uncontrolled hypertension, vasospastic angina, peripheral vascular disease, pregnancy, ischemic cerebrovascular disease, use of other 5-HT agonists or ergotamines if used within 24 hours.
- Dihydroergotamine mesylate (DHE), Ergotamine: Contraindications include pregnancy, ischemic heart disease, vasospastic angina, advanced peripheral vascular disease, ischemic cerebrovascular disease, uncontrolled hypertension, use within 24 hours of receiving any triptan.

Refer to Appendix A "Drug Treatment Tables" in the original guideline document for a detailed list of contraindications to recommended drugs.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- These clinical guidelines are designed to assist-clinicians by providing an analytical framework for the evaluation and treatment of patients, and are not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition. A guideline will rarely establish the only approach to a problem.
- This medical guideline should not be construed as medical advice or medical opinion related to any specific facts or circumstances. Patients are urged to consult a health care professional regarding their own situation and any specific medical questions they may have.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Once a guideline is approved for general implementation, a medical group can choose to concentrate on the implementation of that guideline. When four or more groups choose the same guideline to implement and they wish to collaborate with others, they may form an action group.

In the action group, each medical group sets specific goals they plan to achieve in improving patient care based on the particular guideline(s). Each medical group shares its experiences and supporting measurement results within the action group. This sharing facilitates a collaborative learning environment. Action group learnings are also documented and shared with interested medical groups within the collaborative.

Currently, action groups may focus on one guideline or a set of guidelines such as hypertension, lipid treatment, and tobacco cessation.

Detailed measurement strategies are presented in the original guideline document to help close the gap between clinical practice and the guideline recommendations. Summaries of the measures are provided in the National Quality Measures Clearinghouse (NQMC).

IMPLEMENTATION TOOLS

Clinical Algorithm
Pocket Guide/Reference Cards
Quality Measures

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

RELATED NQMC MEASURES

- Migraine headache: percentage of migraine sufferers with treatment plans for mild, moderate and severe headaches.
- Migraine headache: percentage of migraine sufferers with documented education.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Institute for Clinical Systems Improvement (ICSI). Migraine headache. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2003 Jul. 68 p. [124 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1998 Aug (revised 2003 Jul)

GUIDELINE DEVELOPER(S)

Institute for Clinical Systems Improvement - Private Nonprofit Organization

GUIDELINE DEVELOPER COMMENT

Organizations participating in the Institute for Clinical Systems Improvement (ICSI): Affiliated Community Medical Centers, Allina Medical Clinic, Altru Health System, Aspen Medical Group, Avera Health, CentraCare, Columbia Park Medical Group, Community-University Health Care Center, Dakota Clinic, ENT Specialty Care, Fairview Health Services, Family HealthServices Minnesota, Family Practice Medical Center, Gateway Family Health Clinic, Gillette Children's Specialty Healthcare, Grand Itasca Clinic and Hospital, HealthEast Care System, HealthPartners Central Minnesota Clinics, HealthPartners Medical Group and Clinics, Hutchinson Area Health Care, Hutchinson Medical Center, Lakeview Clinic, Mayo Clinic, Mercy Hospital and Health Care Center, MeritCare, Mille Lacs Health System, Minnesota Gastroenterology, Montevideo Clinic, North Clinic, North Memorial Care System, North Suburban Family Physicians, Northwest Family Physicians, Olmsted Medical Center, Park Nicollet Health Services, Pilot City Health Center, Quello Clinic, Ridgeview Medical Center, River Falls Medical Clinic, Saint Mary's/Duluth Clinic Health System, St. Paul Heart Clinic, Sioux Valley Hospitals and Health System, Southside Community Health Services, Stillwater Medical Group, SuperiorHealth Medical Group, University of Minnesota Physicians, Winona Clinic, Ltd., Winona Health

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SOURCE(S) OF FUNDING

The following Minnesota health plans provide direct financial support: Blue Cross and Blue Shield of Minnesota, HealthPartners, Medica, Metropolitan Health Plan, PreferredOne and UCare Minnesota. In-kind support is provided by the Institute for Clinical Systems Improvement's (ICSI) members.

GUIDELINE COMMITTEE

Committee on Evidence-Based Practice

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

In the interest of full disclosure, Institute for Clinical Systems Improvement (ICSI) has adopted a policy of revealing relationships work group members have with companies that sell products or services that are relevant to this guideline topic. The reader should not assume that these financial interests will have an adverse impact on the content of the guideline, but they are noted here to fully inform readers. Readers of the guideline may assume that only work group members listed below have potential conflicts of interest to disclose.

John Beithon, MD, is a member of the speakers bureau for GlaxoSmithKline.

Frederick Taylor, MD, is a member of the speakers bureau for AstraZeneca, Elan, GlaxoSmithKline, Merck, U.S. Human Health, Pharmacia, Allergan, and UCB Pharma. He has received research grants from GlaxoSmithKline and AstraZeneca.

Jerry Swanson, MD, is a consultant for AstraZeneca and Winston Laboratories. He has received research grants from Winston Laboratories and Pharmacia.

No other work group members have potential conflicts of interest to disclose.

ICSI's conflict of interest policy and procedures are available for review on ICSI's website at www.icsi.org.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previously released version: Migraine headache. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2002 Jul. 74 p.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Institute for Clinical Systems Improvement (ICSI) Web site.

Print copies: Available from ICSI, 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; telephone, (952) 814-7060; fax, (952) 858-9675; Web site: www.icsi.org; e-mail: icsi.info@icsi.org.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Migraine headache. In: ICSI pocket guidelines. April 2003 edition. Bloomington (MN): Institute for Clinical Systems Improvement, 2003 Mar. p. 340-72.

Print copies: Available from ICSI, 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; telephone, (952) 814-7060; fax, (952) 858-9675; Web site: www.icsi.org; e-mail: icsi.info@icsi.org.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on February 5, 2003. The information was verified by the guideline developer on February 20, 2003. This summary was updated by ECRI on April 16, 2004. This summary was updated by ECRI on January 12, 2005 following the release of a public health advisory from the U.S. Food and Drug Administration regarding the use of some non-steroidal anti-inflammatory drug products.

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Date Modified: 1/17/2005